

CLAIMS

1. A burner for treating a waste gas, characterized in that a flame stabilizing zone is open toward a combustion chamber, surrounded by a peripheral wall, and closed by a plate remotely from said combustion chamber, and a waste gas, an auxiliary combustible agent, and air are introduced into and mixed with each other in said flame stabilizing zone, and the mixed gases are ejected toward said combustion chamber perpendicularly to said plate.

2. A burner according to claim 1, characterized in that said plate has, defined therein, a waste gas flame hole for ejecting the waste gas toward said flame stabilizing zone and an auxiliary combustible gas flame hole for ejecting the auxiliary combustible gas, and a peripheral wall of said flame stabilizing zone has an air ejection nozzle.

3. A burner according to claim 2, characterized in that said air ejection nozzle is arranged to eject the air substantially circumferentially to produce a swirling flow.

4. A burner according to claim 2, characterized in that said waste gas flame hole has a diameter smaller than inside diameter of said flame stabilizing zone.

5. A burner according to claim 2, characterized in that said waste gas flame hole and said auxiliary combustible gas flame hole are arranged in a substantially circumferential pattern substantially around center of said flame stabilizing zone with said auxiliary combustible gas flame hole being disposed adjacent to said waste gas flame hole.

6. A burner according to claim 2, characterized in that a second auxiliary combustible gas flame hole for ejecting the auxiliary combustible gas is defined in the

peripheral wall of said flame stabilizing zone downstream of said air ejection nozzle in an axial direction of said flame stabilizing zone.

7. A burner according to claim 2, characterized in that said air ejection nozzle
5 comprises air ejection nozzles in a plurality of groups divided along the axial direction of said flame stabilizing zone.

8. A burner according to claim 1, characterized in that said flame stabilizing zone
is of a cylindrical shape.

10

9. A burner according to claim 8, characterized in that said flame stabilizing zone
and said combustion chamber are of a cylindrical shape and have substantially same
diameter.

15

10. A burner according to claim 1, characterized in that a second flame
stabilizing zone is disposed downstream in the axial direction of said flame stabilizing
zone, and has, defined in a peripheral wall thereof, a second auxiliary combustible gas
flame hole for ejecting a second auxiliary combustible gas, and a combustion chamber is
disposed downstream of said second auxiliary combustible gas flame hole in an axial
20 direction of said second flame stabilizing zone.

20

11. A burner according to claim 10, characterized in that said air ejection nozzle
comprises air ejection nozzles in a plurality of groups divided along the axial direction of
said first flame stabilizing zone.

25

12. A burner according to claim 10, characterized in that said second auxiliary
combustible gas flame hole comprises second auxiliary combustible gas flame holes in a
plurality of groups divided along the axial direction of said second flame stabilizing zone.

13. A burner according to claim 10, characterized in that said first and second flame stabilizing zones and said combustion chambers are of a cylindrical shape and have substantially same diameter.

5

14. A burner according to claim 1, characterized in that a pipe or a hole for directly viewing combustion flames is disposed upstream of the combustion flames in said flame stabilizing zone or said combustion chamber, and a UV sensor is provided for detecting the combustion flames through said pipe or said hole.

10

15. A burner according to claim 1, characterized in that a mixer positioned outside of a supply unit for the auxiliary combustible agent, is provided for mixing an oxygen-containing gas from an oxygen-containing gas supply line and a fuel gas from a fuel gas supply line, and supplying the gases to said combustion chamber, in which the supplied gases are combusted to produce combustion flames.

15

16. A burner according to claim 1, characterized in that a flow speed accelerating means is disposed in said waste gas chamber for increasing flow speed of a combustible waste gas to a level equal to or higher than combustion velocity of the combustible waste gas.

20